

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 2 of 12

*Amendments to the Claims*

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A global, paperless, aircraft maintenance system comprising:
  - an aircraft performance means for detecting aircraft performance and control parameters;
  - a maintenance communications means, located on board an aircraft, for providing maintenance advice to maintenance personnel;
  - a sensor multiplexer receiver and transmitter means, located on board said aircraft, for:
    - accepting said aircraft performance and control parameters;
    - converting said aircraft performance and control parameters, when necessary, to digital form;
    - adding an aircraft identification and configuration label;
    - converting said aircraft performance and control parameters and said identification and configuration label to an outgoing rf signal and broadcasting said outgoing rf signal; and
    - receiving an incoming rf signal, converting it to a maintenance advisory,

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 3 of 12

and feeding said maintenance advisory to said maintenance communication means;

an aircraft manufacturer's database means for providing aircraft data and maintenance information;

a central station means, located on the ground, for receiving said outgoing rf signal and converting it to said aircraft performance and control parameters and said aircraft identification and configuration label, and broadcasting said incoming rf signal;

a processing means, connected to said central station means, for:

- archiving said aircraft performance and control parameters thus creating an archived data database;
- combining said aircraft performance and control parameters with said aircraft data and said maintenance information;
- generating said maintenance advisory based upon said configuration label; and converting said maintenance advisory to said incoming rf signal;
- a display and control means, connected to said processing means, for displaying operation of said processing means and for allowing operator control of said processing means; and
- a global rf communications network means for conveying said

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 4 of 12

outgoing signal from said aircraft to said central station means and conveying said incoming rf signal from said central station means to said aircraft.

2. (Currently Amended) A global, paperless, aircraft maintenance system comprising:
  - aircraft sensors which detect aircraft performance and control parameters;
  - means, located on board an aircraft, for providing maintenance advice to maintenance personnel;
  - a sensor multiplexer receiver and transmitter, located on board said aircraft, which:
    - accepts said aircraft performance and control parameters;
    - converts said aircraft performance and control parameters, when necessary, to digital form;
    - adds an aircraft identification and configuration label;
    - converts said aircraft performance and control parameters and said aircraft identification and configuration label to an outgoing rf signal and broadcasts said outgoing rf signal; and
    - receives an incoming rf signal, converts it to a maintenance advisory, feeds said maintenance advisory to said [maintenance communication] means for providing maintenance advice to maintenance personnel;

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 5 of 12

an aircraft manufacturer's database for providing aircraft data and maintenance information;

a central station, located on the ground, which receives said outgoing rf signal and converts it to said aircraft performance and control parameters and said aircraft identification and configuration label, and broadcasts said incoming rf signal;

a processing means, connected to said central station, for:

archiving said aircraft performance and control parameters thus creating an archived data database;

combining said aircraft performance and control parameters with the archived data, and said aircraft data and maintenance information;

generating said maintenance advisory based upon said configuration label;

and

converting said maintenance advisory to said incoming rf signal;

a display and control subsystem, connected to said processing means, and a global rf communications network which conveys said outgoing signal from said aircraft to said central station and conveys said incoming rf signal from said central station to said aircraft.

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 6 of 12

3. (Currently Amended) A method of providing global, paperless, aircraft maintenance advisories comprising the steps of:

mounting a performance sensor in an aircraft;

mounting a control sensor in said aircraft;

mounting a means in said aircraft, for providing maintenance advice to maintenance personnel;

mounting a sensor multiplexer receiver and transmitter system, in said aircraft;

providing communications access to an aircraft manufacturer's database;

providing a central ground based station;

providing a processing means within said central ground based station;

providing a display and control subsystem, connected to said processing means;

providing a global, rf communications network;

accepting signals from said aircraft performance and control sensors into said sensor multiplexer receiver and transmitter;

converting, in said sensor multiplexer receiver and transmitter, said signals from said aircraft performance and control sensors, when necessary, to digital form;

adding an aircraft identification and configuration label;

converting said signals from said aircraft performance and control sensors, and said aircraft identification and configuration label, in said sensor multiplexer receiver and transmitter, to an outgoing rf signal;

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 7 of 12

transmitting said outgoing rf signal from said sensor multiplexer receiver and transmitter to said central ground base station via said global rf communications network; receiving said outgoing rf signal at said central ground based station; converting said outgoing rf signal at said ground based central station to said aircraft performance and control signals plus said aircraft identification and configuration label; performing within said processing means the steps of:

archiving said aircraft performance and control signals thus creating an archived data database;

combining said aircraft performance and control signals with the archived data, and information from said aircraft manufacturer's database;

generating maintenance advisories based upon said configuration label; and

converting said maintenance advisories to an incoming rf signal;

sending said incoming rf signal, via said global communications network, from said central ground based station to said sensor multiplexer receiver and transmitter;

converting said incoming rf signal, at said sensor multiplexer receiver and transmitter, to said maintenance advisories; and

feeding said maintenance advisor[[y]]ies from said sensor multiplexer receiver and transmitter to said [maintenance communication] means for providing maintenance advice to maintenance personnel.

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 8 of 12

4-63. (Canceled)

64. (Currently Amended) An aircraft maintenance system for use on an aircraft having a flight data recorder, the maintenance system comprising:

a transmitter portable to be placed on an aircraft, said transmitter configured for transmission of digital aircraft performance data across a communication network while said aircraft is in flight; and  
a central station connected to said communication network configured to receive and analyze said digital aircraft performance data to generate maintenance advice for said aircraft while said aircraft is in flight,  
wherein said digital aircraft performance data includes an identifier unique to a particular aircraft and a configuration label, and at least a portion of said digital aircraft performance data comprises data directed to the flight data recorder.

65. (Canceled)

66. (Currently Amended) The aircraft maintenance system of claim 64 further comprising:  
a sensor multiplexer located on said aircraft, said sensor multiplexer having a plurality of inputs for receiving aircraft performance and control parameters from existing aircraft sensors, and an output in communication with said transmitter for providing said digital aircraft performance data to said transmitter.

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 9 of 12

67. (Currently Amended) The aircraft maintenance system of claim 64 wherein said digital aircraft performance data further includes digitized audio information.
68. (Currently Amended) The aircraft maintenance system of claim 64 wherein said digital aircraft performance data further includes digitized video information.
69. (Currently Amended) The aircraft maintenance system of claim 64 wherein said digital aircraft performance data includes aircraft position data directed to said flight data recorder.
70. (Previously Presented) The aircraft maintenance system of claim 69 wherein information provided by a GPS receiver is used in the calculation of said aircraft position data.
71. (Previously Presented) The aircraft maintenance system of claim 70 wherein information provided by an inertial navigation system is used in the calculation of said aircraft position data.
72. (Currently Amended) The aircraft maintenance system of claim 64, wherein said central station is further configured to digitally transmit said maintenance advice to said communication network, the aircraft maintenance system further comprising:  
a receiver on said aircraft configured to receive digital data from said communication network; and

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 10 of 12

a maintenance communication means, located on said aircraft, for providing said maintenance advice to maintenance personnel, said maintenance communication means having an input for receiving said maintenance advice from said receiver.

73. (Previously Presented) The aircraft maintenance system of claim 72 wherein said maintenance advice is provided aurally to said maintenance personnel.

74. (Currently Amended) The aircraft maintenance system of claim 68 wherein said central station includes a storage system for storing said digital aircraft performance data.

75. (Previously Presented) An aircraft maintenance system comprising:  
a transmitter positionable to be located on an aircraft, said transmitter configured for transmission of data across a communication network while said aircraft is in flight;  
a ground based station connected to said communication network configured to receive and analyze said transmission of data, while said aircraft is in flight, to generate maintenance advice for said aircraft; and  
a sensor multiplexer located on said aircraft, said sensor multiplexer having a plurality of inputs for receiving aircraft performance and control parameters from aircraft sensors as said data and an output in communication with said transmitter for providing said data to said transmitter;

Application No. 10/004,429  
Supplemental Amendment Dated 04/06/2006  
Page 11 of 12

wherein said data further includes an aircraft identifier unique to a particular aircraft and a configuration label.

76. (Currently Amended) The aircraft maintenance system of claim 75, wherein said ground based station is further configured to transmit said maintenance advice to said communication network further comprising:

a receiver located on said aircraft, said receiver configured to receive said maintenance advice from said communication network; and  
a maintenance communication means which receives said maintenance advice from said receiver and provides said maintenance advice to maintenance personnel.

77. (Previously Presented) The aircraft maintenance system of claim 75 wherein said ground based station includes a storage system for archiving said aircraft performance and control parameters.

78-95 (Cancelled)